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Temperament in Late Talkers

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This study examines the temperamental characteristics of children who were identified at age two as being slow in expressive language development, and those of peers with normal language history. When the children were in first grade (approximately age six), parents and clinicians rated subjects' temperamental characteristics, using a standardized temperament assessment instrument. Subjects with a history of slow expressive language development were rated significantly lower on Approach/Withdrawal—indicating shyness, aloofness, or reduced outgoingness—than peers with normal language history. Approach/Withdrawal scores were significantly correlated with average sentence length in spontaneous speech, and this measure also predicted Approach/Withdrawal scores in regression analyses. The clinical and theoretical implications of these findings for early language delay are discussed.

Keywords: Shyness, language disorder, schoolchildren.

Abbreviations: DSS: Developmental Sentence Score; ELD: expressive language delay; HELD: history of slow expressive language development; LDS: Language Development Survey; MLU: mean length of utterance in morphemes; NL: normal language; PCC: Percent Consonants Correct; PLDP: Portland Language Development Project; SELD: slow expressive language development; TABC: Temperament Assessment Battery for Children; TOLD: Test of Language Development.

One of the most common developmental problems seen by clinicians who work with young children is the toddler of 18 to 30 months of age who appears normal in every way but who has failed to begin speaking or who speaks very little. It is well known that children with learning disabilities frequently have histories of slow language growth (Catts & Kamhi, 1986; Maxwell & Wallach, 1984; Weiner, 1985), and that 4- to 5-year olds with delayed language tend to have chronic deficits (Aram, Ekelman, & Nation, 1984; Aram & Nation, 1980; Garvey & Gordon, 1973; Griffiths, 1969; Hall & Tomblin, 1978; King, Jones, & Lasky, 1982; Shriberg & Kwiatkowski, 1988). Until recently, though, there were few empirical studies on which to base prognostic statements for 2-year-olds with delayed onset of speech.

Identifying Language Delay in Toddlers

Normal milestones for expressive language growth have been well established in the literature. Nelson (1973) has shown that the majority of middle-class children produce more than 50 different words by 20 months of age. Dale, Bates, Reznick, and Morisset (1989) reported that the average expressive vocabulary size at 20 months is 155 words, with a standard deviation of 87. Thus an expressive vocabulary size of 50 words at 20 months falls more than 1*SD* below the norm in their sample. A variety of other sources (Bzoch & League, 1971; Frankenburg et al., 1990) substantiate the view that children who fail to produce 50-word vocabularies by the middle of the second year of life can be considered to be significantly delayed in language development. Nevertheless, Rescorla (1989) reports that 10–14% of middle-class children sampled with the *Language Development Survey* (LDS) failed to achieve these milestones by their second birthday.

Follow-up Studies of Late-talking Toddlers

In recent years, several research groups have followed the linguistic and academic progress of late-talking toddlers in order to provide the necessary empirical data on prognosis for this population (Paul, 1993; Rescorla & Schwartz, 1990; Scarborough & Dobrich, 1990; Thal, Tobias, & Morrison, 1991; Weismer, Murray-Branch, & Miller, 1994; Whitehurst, Fischel, Arnold, & Lonigan, 1992). These follow-ups generally find that children who present with slow expressive language development (SLED) as toddlers retain deficits in various aspects of speech and expressive language during the pre-school period. By the time they reach 5 years, though, 70–80% perform within the normal range on a variety of language

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measures, and virtually all can function adequately in mainstream school settings during the primary grades (see Paul, in press, for extensive review). However, Paul (in press) reported that these children do show some subtle differences from peers with normal language history at age 5 on measures such as narrative production and speech sound awareness tasks, which are known to be related to reading achievement (Blachman, 1989; Feagans & Applebaum, 1986). Whether such weaknesses will later translate into school achievement problems as the demands of the academic curriculum accelerate in intermediate and secondary grades is not currently known.

Behavioral Characteristics in Children with Language Impairment

One piece of information that might help to address this question concerns the nonlinguistic characteristics of children with a history of SELD. Data on Paul's (in press) cohort show that their nonverbal intelligence scores are well within the normal range at age 5. However, other nonlinguistic areas, including behaviour and social/emotional development, are known to be involved in children with communication disorders. Prizant and Meyer (1993) discussed the interdependence of communication and socioemotional development, and emphasized the high co-occurrence rates of communication and emotional/behavioral disorders in children.

Researchers in child psychology and psychiatry have established a strong empirical database to substantiate the high comorbidity of these disorders. For example, Baker and Cantwell (1982) looked at the prevalence of psychiatric disorders in children with speech and language problems and found that, overall, 44% of these children qualified for some psychiatric diagnosis according to criteria in the *Diagnostic and Statistical Manual of Mental Disorders – Third Edn.* (American Psychiatric Association, 1980). The risk for children with "pure" speech disorders (articulation only) was found to be lower than for those with both speech and language or with only language problems. A 5-year follow-up of the same children (Baker & Cantwell, 1987) showed an increase in overall prevalence of psychiatric disorders with age.

Beitchman, Nair, Clegg, Ferguson, and Patel (1986) conducted an epidemiological study of Canadian 5-year-olds who were assessed for speech and language disorders. They found that 11% had communication disorders and that nearly half of these also showed psychiatric disorders. Prevalence of psychiatric problems for children with normal communication, on the other hand, was 12%. Stevenson and Richman (1978), in an English epidemiological study, found that nearly 60% of 3-year-olds with language delays had psychiatric problems, whereas only 14% of those without language delays showed behavioral difficulties.

Tallal (1988) has taken issue with some of these findings, however. She points out that these studies have not always distinguished between children who have communication disorders only, and those who have language problems secondary to other mental disorders such as retardation or autism. This makes it difficult to know whether the psychiatric problems observed are specifically associated with developmental language disorders, or more generally with other disabilities that include language problems as a secondary symptom. It is clear, then, that any studies of associations between psychiatric and communicative disorders need to be carried out on well-defined groups of children. If the goal of a study is to look at the connection between communication disorders and behavioral problems then children who have disorders of communication only would provide a clearer answer than would studies that have lumped together children with a variety of both primary and secondary communication disabilities.

Behavioral Characteristics in Late-talking Toddlers

A few studies have examined this issue in young children with circumscribed mild language disorders. Caulfield, Fischel, DeBaryshe, and Whitehurst (1989) studied 2-year-olds with a delay in expressive language disorder relative to their receptive and nonverbal cognitive skills, using both maternal reports of child behavior and direct observation of parent–child interactions. This study reported that the direct observations revealed a higher prevalence of negative behaviors—such as crying, hitting, and throwing—in the children with delays than in a matched sample of peers with normal communication skills. The children with delays were also rated by their mothers as more shy and fearful and as exhibiting more behaviour problems at bedtime. Further, the mothers reported that the children with language delays were less likely to meet parental expectations in social, intellectual, and emotional characteristics.

In another study, Caulfield (189) reported on observations of behaviour in laboratory tasks among these same children. Caulfield showed that 2-year-olds with delayed language did not differ from normally speaking peers in their behavior during a simple pointing task (which was easy for both groups) or in their ability to delay gratification in a laboratory waiting task. Differences did appear, however, on a naming task, which was difficult for the children with delayed language but easy for the normal language group. In this task the children with language delay showed an increased tendency to display tantrums. The results were interpreted to suggest that the behavior problems exhibited by children with language delay are related to their frustration at being unable to communicate, and are sequelae, rather than causes, of the language delay.

Paul and James (1990) also reported on behavioral characteristics of 2-year-olds with specific mild delays in language development. Parental perceptions of behavior in these children were collected, using the Childhood Personality Scale (Cohen, 1975), a parent report questionnaire. Results showed that toddlers with delayed language were perceived by their parents as being significantly more active, inattentive, and difficult to manage, and as showing less positive affect, than were children with normal language.

The follow-up studies cited earlier on these children who present with mild language delays or SELD at age 2 have suggested that prognosis is generally optimistic, and most of these children will "outgrow" the most obvious

aspects of their language delay by school age. These findings suggest that if Caulfield (1989) is right, we would expect the behavior problems of children with language delay to decrease as their language improves and their frustration presumably diminishes proportionally. This pattern would differ from the one reported by Baker and Cantwell, who found that the incidence of psychiatric problems increase with age in children with persistent language problems.

Finding a pattern of decrease in behavioral problems would favour a view of SELD as a developmental lag, as Whitehurst and Fischel (1994) and Leonard (1991) have suggested, rather than as a bona fide pathology. Thus, investigating the behavioral manifestations of SELD over time will contribute to an understanding of the origins of this developmental pattern, and to building credible theories regarding this condition. The present report will address the temperamental characteristics, as reported by parents and clinicians, of children with SELD when they are in their first year in primary grades (approximately 6 years of age) in school, in order to document changes in the behavioral expression associated with the condition of SELD.

Defining and Assessing Temperament

According to Thomas and Chess (1977), *temperament* is the "how" of behavior, or an individual's inherent behavioral style. Temperament is thought to be a stable, constitutional characteristic that influences the manner and intensity with which individuals respond to stimuli they encounter, although temperament can be modified by the interactional environment. Thomas and Chess (1977) used a parent report instrument to assess temperament in their classic study of this variable.

Martin (1988) pointed out that data from parent reports on child temperament may contain certain biases due to the parents' emotional involvement with the child and the parent's own limited frame of reference about behavior and its normal variability. To address these potential problems in the collection of temperament data, Martin developed the *Temperament Assessment Battery for Children* (TABC), which employs multiple raters including parents, clinicians, and teachers, in order to get a fuller view of the child's temperamental characteristics across a variety of situations.

The present study employs Martin's TABC to obtain ratings from parents and clinicians in order to describe the expression of temperamental characteristics of children with a history of SELD at early school age.

Method

Participants

The Portland Language Development Project (PLDP), a longitudinal study of outcomes of early language delay, has been conducting yearly follow-ups on a cohort of young children who were slow to begin talking. Participants were recruited into the study through pediatricians' offices, radio announcements, and newspaper advertisements requesting participation of families of 2-year-olds who did not talk. Twenty-eight children with little speech at age 2 were recruited through these outlets and remained in the study through age 6. SELD diagnosis was confirmed at intake by having parents fill out Rescorla's (1989) *Language Development Survey* (LDS), a checklist of 300 of the most common words in children's early vocabularies, which has been shown to have high validity, reliability, sensitivity, and specificity for identifying language delay in 2-year-olds. Children whose families reported fewer than 50 words on this measure were considered SELD. A contrast group of normal language (NL) toddlers, whose parents reported more than 50 words on the LDS, was recruited through the same pediatricians' offices. The contrast group was matched to the SELD group on the basis of age, socioeconomic status (middle class), sex ratio, birth order, and performance on nonverbal cognitive tasks. Twenty-three children in the contrast group participated in the study at age 6.

All participants scored above 85 on the *Bayley Scales of Infant Development*–Mental Scale (Bayley, 1969) at intake, and there was no difference in performance between the NL and SELD groups on the nonverbal items on this test (Paul, 1991). Children were screened for hearing impairment, using visually reinforced audiometry, and were screened observationally for neurological disorders and autism. Demographic characteristics appear in Table 1. Children described in the present report are the same ones as those discussed in Paul and James (1990, when the participants were 2 years old) and Paul (in press, when the children were at early school age). It should be noted that all the children in this study came from middle-class families. Moreover the families in the sample were small, with none having more than three children.

Procedures

These children were given an extensive battery of language and related assessments, including parental ratings of maladaptive behaviors and parental ratings of behavior on the Childhood Personality Scale (Cohen, 1975), at intake into the study, when they were 2 years old (see Paul, 1991, for complete protocol). They have been seen yearly for re-evaluation of language and related skills. At each of these evaluations, a variety of standardized tests and criterion-referenced procedures to evaluate language and related developments have been administered (see Paul, in press, for complete protocol). Spontaneous speech samples have also been gathered each year and analyzed for syntactic maturity using Lee's (1974) *Developmental Sentence Score* (DSS). In addition, these same speech samples have been analyzed for length of utterance in morphemes (MLU; Brown, 1973), intelligibility (using a subjective rating: good, fair, poor), and for phonemic accuracy (using Percent Consonants Correct; Shriberg & Kwiatkowski, 1982).

When participants were in first grade (approximately age 6), parent and clinician ratings on Martin's (1988) TABC were also collected. Parent ratings were gathered during an assessment interview with the child; parents filled out the rating form, while one of two trained graduate student research assistants tested the child. Clinician ratings on the TABC were obtained by having the graduate student research assistant who worked directly with the child rate each participant. Ratings were made following an intensive 2-hour observation, during which time the research assistant administered a variety of standardized tests and criterion-referenced language measures, and observed the child in free play with the parent. Scoring of both instruments followed instructions given by the author in the TABC's manual.

Subgroup Assignments in First Grade (Age 6)

At age 6, Developmental Sentence Scores were used to assign children with a history of SELD to one of two subgroups. Each childs' DSS score was compared to that child's current

Table 1
Demographic Information at Intake

		Age in months		Vocabulary size[a]		SES[b]		
Group	*N*	Mean	(*SD*)	Mean	(*SD*)	Mean	(*SD*)	% male
NL	23	26.1	(4.3)	212.2	(66.1)	3.5	(1.2)	65
SELD	28	24.8	(3.9)	29.7	(26.2)	3.6	(0.8)	71

[a] As reported by parents on Rescorla's (1989) *Language Development Survey*.
[b] Derived from Myers and Bean's (1968) adaptation of Hollingshead's four factor scale of social position on a scale from 1 to 5.

chronological age. Participants' DSS scores were then assigned to one of two categories, using data from Lee (1974): (1) at or above the 10th percentile for age; i.e. within the normal range; or (2) below the 10th percentile for age; i.e. below the normal range.

These assignments were used to place children with SELD into one of two subgroups: those with a history of slow expressive language development (HELD) who were currently functioning within the normal range in terms of DSS score; and those with chronic expressive language delay (ELD), who were slow in language development as toddlers and were still demonstrating DSS scores below the normal range at age 5 or 6. All the NL children who participated in the follow-up study scored above the tenth percentile on the DSS at age 6.

Instruments

TABC. The *Temperament Assessment Battery for Children* (TABC) consists of three scales: a Parent form, a Teacher form, and a Clinician form. For the purpose of this study only the Parent and Clinician forms were used. The Parent form contains 48 items, divided into 6 scales: Activity, Adaptability, Approach/Withdrawal, Emotional Intensity, Ease of Management through Distraction, and Persistence. Parents are asked to rate their children based on their current functioning. Ratings are made independently of the ratings of any other individuals.

The Clinician form contains 24 items, and is meant to be filled out immediately after a clinician has completed an assessment session with a child. It is divided into five scales. Activity, Adaptability, Approach/Withdrawal, and Persistence are parallel to scales on the Parent form. Distractibility replaces the Emotional Intensity and Ease of Management through Distraction scales from the Parent form. The items were developed in order to capture the situational variation that can affect children's behavior. For this reason, the scales for the various informants are somewhat different. Parents are asked questions relating to the child's emotional intensity and ease of management, since their ongoing contact with the child allows them to make such evaluations. Clinicians, on the other hand, would not be expected to be able to observe these aspects of behavior during a relatively short assessment session. Instead, the clinician is asked to assess the child's attention and distractibility during the assessment interview.

Each item is scored by the rater on a 7-point scale. Scores given for each item are summed for each scale and converted to T-scores (with a mean of 50 and a standard deviation of 10), based on normative data in the TABC manual. Martin (1988) reports internal consistencies of .7–.9 on the six scales for the three forms. Test–retest reliabilities on the Parent forms show 1–2 year stability in the .43–.7 range.

Reliability for the clinicians' ratings on the TABC was obtained by having a second graduate research assistant observe 13% of the assessment sessions and rate each child independently following the observation. Each rating given was then compared between the two graduate research assistants, and percentage of agreement was computed using a point-to-point method. Inter-rater reliability of the clinician temperament ratings was 94%.

DSS. The Developmental Sentence Score (Lee, 1974) is a procedure for rating the maturity of syntactic and morphological forms in spoken language. It requires the analysis of 50 utterances and rates 8 grammatical categories (personal pronouns, indefinite pronouns, main verbs, secondary verbs, conjunctions, negatives, interrogative reversals, and question words) on an 8-point scale, based on their order of acquisition in normal development. A number of points is awarded to each utterance in the sample, based on the scores obtained for each of the 8 categories. Scores for each utterance are then summed and averaged to calculate the DSS. Norms were established for the DSS based on a sample of 200 children between the ages of 2 and 7. Lee reports overall internal consistency on this measure at .71, with split-half reliabilities of .73. Good temporal stability and inter-rater reliabilities are also reported.

Reliability measures for assigning DSS scores were obtained by having a second researcher independently re-analyze 10% of the transcripts and assign a DSS. For inter-rater reliability for this measure, we used a point-to-point method (McReynolds & Kearns, 1983) by counting the number of utterances for which the two raters assigned the same number of DSS points in each sample and then by dividing that number by the total number of utterances in the sample. This percentage was then averaged across the samples used in the reliability study. Reliability calculated using this method was 93%.

MLU. Speech samples were entered into the SALT Computer program (Miller & Chapman, 1985), which automatically computed mean length of utterance in morphemes.

Intelligibility rating in free speech. At the end of the collection of each 10-minute speech sample, the graduate student collecting it made a subjective judgment as to the intelligibility of the speech sample observed, on a 3-point scale (1 = good, 2 = fair, 3 = poor). Gordon-Brannan (1994) reported that rating scales such as this are frequently used in assessing speech intelligibility, and that these ratings correlate more highly than other forms of intelligibility assessment with objective measures of the proportion of intelligible words in speech samples. Shriberg and Kwiatkowski (1982) showed high reliability among clinicians in assigning these ratings. We established reliability for the PLDP cohort by having a second graduate research assistant sit in on 10% of the speech sample collection sessions and independently assign a rating to these samples. Inter-rater reliability was 86% at age 4 and 100% at age 6.

Percent Consonants Correct (PCC). Shriberg and Kwiatkowski (1982) proposed the PCC as a more quantitative measure of speech intelligibility than subjective ratings. Their method for computing PCC was followed in arriving at PCC values for the speech samples in this study. The middle 100 words in each speech sample were used, and phonemic transcriptions for each consonant produced by the children were derived from the audiotaped speech samples. Target words

were identified by comparing the phonemic transcriptions to the orthographic transcriptions made previously for the DSS analysis. PCC was derived by counting the number of correct consonants (relative to the target consonants in words in the orthographic transcriptions) and dividing by the number of correct plus number of incorrect (relative to the target consonants in words in the orthographic transcriptions) consonants in the 100-word sample. We established reliability by having a second rater listen independently to an audiotape of 10% of the speech samples and compute PCC as just described. Inter-rater reliability was 98% using this method.

Standardized language testing. The *Test of Language Development-Primary* (TOLD; Newcomer & Hammill, 1988) was administered to all the children at age 6, in order to assess oral language abilities using a norm-referenced format.

Results

Temperament Differences among Subgroups in First Grade (Age 6)

As described earlier, at the time when the TABC data were collected when the children were in first grade, the children with a history of SELD were divided into two subgroups:

(1) those with a history of SELD who continued to score below the normal range (below the tenth percentile) of syntactic production, as indexed by the DSS (Lee, 1974). This group is referred to as the chronic Expressive Language Delay (ELD) group and contained six participants (21% of the original SELD group).

(2) those with a history of SELD who scored within the normal range of syntactic production (above the tenth percentile) on the DSS. This group is referred to as the history of expressive language delay (HELD) group and contained 22 children (79% of the original SELD group).

All 23 children in the NL group scored within the normal range on the DSS in first grade.

Tables 2 and 3 give the mean T-scores of the three diagnostic groups on each of the scales of the TABC for each of its two forms (Parent and Clinician). Analysis of variance revealed that there was a significant difference among the three groups only on the Clinical ratings on the Approach/Withdrawal scale ($F = 3.8$; $p < .03$). The difference in Approach/Withdrawal scores also approached significance on the Parent ratings ($F = 2.6$; $p < .08$). To follow up the significant difference seen on Approach/Withdrawal on the Clinician scale, post hoc analysis was done using the Tukey procedure. This indicated that the HELD group differed significantly ($p < .01$) from the NL group on clinical ratings of Approach/Withdrawal. The number of children in the ELD group was too small to reveal a significant difference in this analysis, although scores of the ELD group were similar to those of the HELD group, and the scores of the ELD group on the Approach/Withdrawal ratings given by parents were lower than those given to children in the

Table 2
Mean (and SD) T scores with Significance Tests on TABC Scales for Three Diagnostic Groups: Parent Form

	Diagnostic group		
Scale	NL ($N = 23$)	ELD ($N = 6$)	HELD ($N = 22$)
Activity	50.3 (9.7)	52.2 (12.0)	49.1 (9.4)
Adaptability	48.0 (8.1)	41.7 (13.2)	47.0 (10.0)
Approach/Withdrawal[a]	51.4 (10.2)	41.7 (13.7)	45.8 (10.5)
Emotional intensity	49.6 (9.0)	49.7 (9.9)	51.5 (10.6)
Ease of management	44.0 (11.1)	39.3 (12.8)	44.3 (10.8)
Persistence	52.3 (7.4)	44.7 (8.8)	49.8 (7.7)

[a] Difference among groups approaches significance at $p < .08$.

Table 3
Mean (and SD) T scores with Significance Tests on TABC Scales for Three Diagnostic Groups: Clinician Form

	Diagnostic group		
Scale	NL ($N = 23$)	ELD ($N = 6$)	HELD ($N = 22$)
Activity	49.4 (8.0)	48.0 (6.0)	49.2 (8.8)
Adaptability	50.3 (6.2)	52.5 (3.3)	46.6 (9.0)
Approach/Withdrawal[a]	50.8 (5.0)[1]	47.7 (5.8)	46.6 (5.2)[2]
Distractibility	51.3 (8.7)	49.8 (3.0)	54.5 (10.2)
Persistence	54.3 (5.0)	55.0 (3.7)	53.9 (6.0)

[a] Difference among groups reaches significance at $p < .03$. Groups with differing superscripts were significantly different on post hoc testing, using the Tukey procedure.

Table 4
Mean (and SD) First Grade (Age 6) Speech and Language Scores in Three Groups

Measures	Diagnostic group NL	ELD	HELD
DSS[a]	8.1 (1.3)[1]	4.8 (2.1)[2]	7.7 (1.0)[1]
MLU	5.0 (1.4)	4.2 (1.7)	4.7 (1.4)
TOLD-P			
Receptive quotient	104.0 (11.2)	94.9 (13.4)	103.0 (13.8)
Expressive quotient[a]	108.4 (9.0)[1]	82.6 (11.4)[3]	98.7 (10.9)[2]
PCC	95.7 (7.1)	88.6 (6.6)	92.5 (8.4)
Intelligibility rating in free speech[a, b]	1.0 (0.0)[1]	1.5 (0.5)[2]	1.2 (0.4)[1, 2]

[a] Significant difference among groups at $p < .05$; groups with differing superscripts differed on Tukey HSD post hoc comparisons, those with the same superscripts did not.
[b] Subjective ratings of intelligibility: 1 = good, 2 = fair, 3 = poor.

Table 5
Pearson Product–Moment Correlations (r) between T scores on Parent TABC and First Grade (Age 6) Language Measures for Children with SELD

	Activity	Adaptability	Approach/ Withdrawal	Emotional Intensity	Ease of Distraction	Persistence
PCC	−.002	.07	.06	−.26	.07	.11
Intelligibility	−.13	−.10	−.02	−.008	.08	−.03
MLU	.43*	−.11	.19	.36	−.24	−.24
DSS	−.01	−.16	.14	.03	.08	−.01
TOLD						
Receptive	−.05	.04	.28	−.08	−.05	−.02
Expressive	−.08	−.03	−.02	.03	.03	.27

other two groups on the Parent ratings. There was a significant correlation, as well, between Parent and Clinician ratings on the Approach/Withdrawal scale ($r = .41, p < .04$). Martin (1988) reports that this scale is designed to measure the tendency to be socially outgoing vs. shy, aloof, or reserved. Lower scores indicate a weaker tendency toward outgoingness or a tendency to shyness/aloofness. It should be noted, though, that all groups did fall within the normal range on this measure, as they did on all the other temperament scales measured here. There were no other significant differences among groups on any of the other temperament scales.

Speech and Language Scores

Table 4 reports the scores of the three diagnostic groups on the speech and language measures collected: DSS, MLU, TOLD, the intelligibility rating, and PCC. Analysis of variance revealed that the group classified by the DSS score as showing a chronic language delay scored significantly lower on this measure than did children with HELD or NL. When looking at expressive language in spontaneous speech using MLU, however, which measures only length, not complexity, significant differences did not occur. There were significant differences among the three groups in their scores on expressive language on the standardized TOLD, with children with NL scoring significantly higher than those with HELD, who scored significantly higher than children with ELD. No significant differences were found on receptive scores on this measure. Significant differences did not appear on PCC in spontaneous speech, but there was a significant difference in clinician ratings of intelligibility. All the children with NL received ratings of "good," as did most of the children in the other two groups. However, children with ELD were more likely to receive a rating of "fair." Children with HELD fell midway between those with ELD and NL on this measure and did not differ significantly from either of the other two groups in their intelligibility ratings. It should be noted, though, that all the children were correct in their consonant production more than 88% of the time, and all were basically comprehensible in their speech.

Correlations between Temperament Ratings and Speech/Language Scores in First Grade (Age 6)

Table 5 presents Pearson product-moment correlations between the ratings on the various TABC *parent* scales and scores on the speech and language measures for children in the SELD group in first grade. Table 6 presents the same data for correlations between *clinician* TABC scales and SELD speech and language scores in first grade. These correlations revealed that Clinician ratings of Approach/Withdrawal correlated positively with MLU ($r = .49, p < .01$), indicating that higher scores on this TABC measure (which indicate greater outgoingness) are associated with higher MLUs in free speech.

Table 6
Pearson Product–Moment Correlations (r) between T scores on Clinician TABC and First Grade (Age 6) Language Measures for Children with SELD

	Activity	Adaptability	Approach/ Withdrawal	Distractibility	Persistence
PCC	−.22	−.002	.27	−.16	.01
Intelligibility	.21	.08	−.21	.07	.05
MLU	.09	.01	.50*	.09	.08
DSS	.03	−.17	.29	.15	−.03
TOLD					
Receptive	−.12	−.06	−.02	.04	.10
Expressive	−.23	.09	.23	−.04	.14

Parental ratings of Activity were also found to correlate significantly with MLU ($r = .43$, $p < .03$). No other significant correlations were found.

Predicting Temperament Ratings from Speech/Language Scores

In order to determine whether the tendency toward shyness observed in this sample could be attributed to speech and language difficulties, regression analyses were used to predict concurrent Approach/Withdrawal scores in children with a history of SELD, using speech and language data collected during the first grade (age 6) evaluation. These analyses revealed that only MLU significantly predicted Clinician Approach/Withdrawal ratings ($r^2 = .22$; $p < .02$). None of the other speech or language measures was found to be a significant predictor.

In order to look at the effects of earlier speech and language performance on Approach/Withdrawal ratings in the children with a history of SELD, regression analyses were run attempting to predict Approach/Withdrawal ratings in first grade (age 6) using speech/language scores collected when the children were 4 years old. The same instruments had been used to collect speech and language data at follow-up evaluations when the children were aged 4 years: DSS, MLU, TOLD Expressive and Receptive standard scores, PCC, and intelligibility ratings. These were entered into a regression analysis to predict first-grade ratings of Approach/Withdrawal on the TABC in the children with SELD. This analysis revealed that, again, only MLU at age 4 was a significant predictor of Clinician Approach/Withdrawal scores in first grade ($r^2 = .15$; $p < .06$).

Discussion

These data suggest that middle-class children with a history of SELD manifest a tendency toward shyness/aloofness in the early school grades, although this tendency does not place them outside the normal range. Interestingly, the children with a history of SELD were not rated as different from peers with normal language history on activity level, distractibility, persistence, or ease of management by parents or clinicians. This finding is surprising in light of the fact that Paul and James (1990) reported that parents of these same children rated them at age 2 as more active, inattentive, moody, and difficult to manage than parents of peers with NL rated their toddlers. These findings support Caulfield's (1989) conclusion that the behavior problems seen in children with SELD stem from their frustration at being unable to communicate. As their communication skills improve, the attendant decrease in frustration appears to lead to a reduction in the perception of problematic behaviors by adults in their environment.

Caulfield et al. (1989) showed that parents of their cohort of delayed language 2-year-olds reported shyness and fearfulness in their children. It would appear that, although the other behavioral difficulties reported in these children when they were toddlers tend to abate with age and improved communication, this trait does not. Thus, whereas the other behavioral problems tend to be results of the communication difficulty, the more stable tendency to be shy and withdrawn may be part of the temperamental picture of children with slow language development, and may contribute in some measure to their delay. That is, children who tend to be shy and withdrawn may be less motivated to communicate, and this dearth of motivation may function, along with other factors, to slow the growth of their language. Paul and Shiffer (1991) found that toddlers with SELD initiated communication less frequently, either verbally or nonverbally, than did children with normal language. Paul and Shiffer speculated that more infrequent communication, which resulted in a reduced amount of practice and feedback, could contribute to the slower rate of language acquisition in this population.

The findings on the correlation between MLU and Approach/Withdrawal ratings at age 6, and the significant prediction of 6-year Approach/Withdrawal ratings by both concurrent and pre-school MLU scores, can be construed as supporting this position. That is, MLU at these ages may be seen not as a measure of language complexity, but of talkativeness. Miller, Frieberg, Rolland, and Reeves (1992) have argued that many children with language problems not only talk less well, but simply talk less, in terms of the number of words produced, than their peers with normal development. Although the differences in MLU between children with NL and SELD in this study did not reach significance, the correlation of MLU and Approach/Withdrawal in the SELD group may suggest that the shorter utterances are an indication of reduced garrulousness. The significant correlation between parental ratings of activity and MLU may also

reflect the fact that children who are more active are less likely to produce long sentences, as they are too busy moving to spend a lot of time talking. Since these factors of Activity and Approach/Withdrawal do not correlate significantly with DSS, it cannot be said that the syntactic complexity of a child's speech is related to these behavioral factors. Rather it is likely to be the amount of talking that is associated. Thus MLU could be seen as a measure of willingness to elaborate and expand utterances, as opposed to supplying a "bare minimum" of information. It may be this aspect of the MLU measure that explains its relation to both the activity and shyness ratings reported here.

It is also of interest to note that it was not only the ratings of children who continued to have language delays (the ELD group) that accounted for the significant differences in Approach/Withdrawal found. The results of the analysis of the subgroups showed that even those children with a history of SELD who appeared to outgrow their delays (the HELD group) were also rated significantly lower than NL children on the Approach/Withdrawal measure. This again suggests the role of this temperamental trait in a slow rate of language growth that eventually approximates normal acquisition.

In terms of the theoretical implications of these findings, they can be taken to suggest that the kind of circumscribed early language delay experienced by the children described here seems less likely to be the result of an underlying neurological diathesis, and more likely to be an expression of a developmental lag, mediated by a temperamental tendency toward social withdrawal with reduced motivation to communicate. The evidence for this position is the stability of parental ratings of shyness/fearfulness/withdrawal, combined with the decrease over time in parental perceptions of attention and activity problems—often pointed to as "soft" neurological signs—as well as the decrease in conduct and affect difficulties. The tendency toward shyness that was present early and may have reduced motivation to talk appears to persist, at least to a mild degree, in these children. It should be emphasized again, though, that although Approach/Withdrawal ratings of children with SELD were lower than those of peers with normal language history, these ratings were consistently within the normal range.

In summary, middle-class children who present as late-talking toddlers tend to perform within the normal range of language, achievement, and behavior by the time they reach school age. Still, their language and academic skills are somewhat weaker than those of their NL peers of similar socioeconomic and intellectual level. Parental perceptions of behavior problems in these children when they were toddlers also tend to resolve, probably as communicative frustration diminishes, but children with SELD tend to remain somewhat less outgoing than similar children who experienced normal language development histories. The best predictor of this limited outgoingness is average sentence length, both at age 4 and in primary school. It should be emphasized, though, that the research reported here was conducted on a middle-class sample of children from small, well-functioning families, and cannot be generalized to children raised under less ideal circumstances.

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